REMARKS

This paper is responsive to the Office Action mailed July 20, 2004. Reexamination and reconsideration of the application are respectfully requested.

The Office Action

In the Office Action mailed July 20, 2004:

claims 4-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,088,137 to Tomizawa ("Tomizawa") in view of U.S. Patent No. 6,516,100 to Qian ("Qian");

claims 10-23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tomizawa in view of U.S. Patent No. 5,900,886 to Shay ("Shay").

The Present Application

For purposes of brief review, the present application is directed to a method and system for rendering single colorant versions of color images while preserving as much information from the color image as possible and minimizing image distortion. For example, the present application is directed to a system and method for rendering black and white versions of color images. Typical color image authoring devices can produce over 16 million different colors, while typical black and white rendering devices can only produce 256 shades of gray. Obviously, a great number of colors must be mapped to each level of gray. Therefore, portions of a color image that are quite obviously different colors can appear to be the same color when the image is rendered in black and white. When the image portions in question are, for example, different sections of a pie chart or bar graph, this loss of information can render the chart or graph useless (page 2, lines 5-12).

The systems and methods of the present application addresses this problem by analyzing an image to find colors in the image that would otherwise be rendered in the same manner and altering the rendering process for one or more of these conflicting colors so that the distinctiveness of those portions of the color image, comprised of the colors that conflict in black and white, can be preserved in the black and white version of the image. For instance, the rendering process is altered by adding a texture to portions of the black and white version of the image that represent one or more of the conflicting colors (e.g., compare Fig. 1, 122, 126 to Fig. 9, 922, 926).

For example, the texture is applied through spatial modulation. Spatial modulation may be achieved through the application of selected half tone screens. For instance, the black and white version of a first conflicting color may be rendered using a first line screen and the black and white representation of a second conflicting color may be rendered with a different or second lined screen. Subtle imaging artifacts associated with the selected screens (e.g., the striping visible in Fig. 9) restores some of the distinctiveness of the different colors in the original color image that would have otherwise been lost (e.g., Fig. 1, 122, 126).

It is to be noted that the texturing or spatial modulation notwithstanding, the lightness of the rendered conflicting colors is not altered. Therefore, the lightness of the colors in the original image is preserved in the rendered black and white version of the image. Furthermore, portions of the black and white image that are not associated with conflicting colors remain unaffected. Therefore, deleterious effects of the process are minimized, thereby allowing the methods of the present application to be applied in a default or "walk-up" mode of an image processor, such as, for example, a photocopier.

The Cited References

In contrast, the primary reference of the Office Action, to Tomizawa, is unrelated to rendering single colorant versions of color images. Instead, Tomizawa allegedly discloses a method and a device for extracting a specified image area from an image. For example, a face (skin color) area of a person is extracted with minimized error irrespective of different skin colors of the human races. A hue value calculating portion determines a hue value from an input image (RGB signal). A primary discriminating portion extracts pixels having hue value that lie in a specified range defined by limiting values output from a control portion. A pixel counting portion counts the extracted pixels. The control portion selects a threshold value for extracting a face area according to the count of the extracted pixels and outputs the threshold value to a face area extracting portion which in turn extracts a face area according to the threshold value (Abstract).

Tomizawa asserts that detecting a location of a face of a human figure in an input image and processing the detected area with priority has been an effective method to improve the quality of a video image. Tomizawa further asserts that it is easily understood that a face portion is remarkable in an image displayed on a

display screen of, e.g., a video telephone or a video conference apparatus in the field of video communication. Therefore, Tomizawa asserts, it is preferred to extract a face area from an image and suitable encode and quantize the extracted face area to improve the image quality (column 1, lines 14-23).

It is respectfully submitted that Tomizawa is directed to a method and system for locating a human face in a video image so that remaining portions of the image may be aggressively compressed with lossy compression techniques, while the important or remarkable face portion of the image remains uncompressed or is compressed with techniques that are less lossy or even lossless.

In this regard, Tomizawa is unconcerned with generating black and white versions of color images.

The Office Action asserts that Tomizawa discloses a method for rendering an image described in a multicolor colorspace, in a single colorant colorspace. The Applicant respectfully disagrees. In support of the assertion, the Office Action directs the attention of the Applicants to column 6, lines 1-5 and column 5, lines 31-47. However, these portions of Tomizawa are related to determining a skin color classification for a person in an image. Tomizawa refers to the skin color of white or yellow as a relatively thin color (column 5, lines 33-36) and refers to the skin color of black as thick (column 5, lines 36-38). The control portion 5, of the device of Tomizawa, decides to which group (thick or thin) the extracted persons skin color belongs, from there, determines a range of color component values to be used for further area extraction (column 6, lines 1-5).

Tomizawa discloses using histograms to determine if an image includes a significant number of pixels associated with a skin color. However, Tomizawa does not disclose or suggest classifying peaks within the histogram that have a similar luminance as conflicting colors. Tomizawa discloses that a face area of the input original image in the colorspace is discriminated by detecting peaks above a noise level in respective histograms, and a threshold for the face area in the input colorspace is determined. The obtained threshold is output to a face area extracting portion 4 (column 7, lines 33-37). It is respectfully submitted that, contrary to further assertions of the Office Action, this is unrelated to classifying peaks within the histogram, that have similar luminance, as conflicting colors.

Qian allegedly discloses a method for image characterization using color and texture statistics with embedded spatial information. In the method of Qian a

number of test areas of predefined shape and size are located on the image. The color or texture of the image over each of the test areas is quantified. The image can be characterized by statistical description of the frequency distribution of color or texture of the test areas. It is respectfully submitted that Qian is related to analyzing an image and is unrelated to rendering single colorant versions of color images.

The Office Action asserts that Qian discloses applying at least one distinct spatial modulation and directs the attention of the Applicant to column 3, lines 10-15 in support of the assertion. However, the referenced portion does not disclose or suggest applying a modulation. Instead, the referenced portion (column 3, lines 10-15) outlines a method for characterizing an image comprising the steps of: defining a spatial structure element including a plurality of picture elements, delineating on the image a number of test areas corresponding to the spatial structural element, and quantifying the color, or in the alternative, the texture of the image in the delineated test areas.

It is unclear to the Applicant which portion of the referenced section the Examiner considers to be disclosure of applying at least one distinct spatial modulation. However, the Applicant notes that the referenced section includes the phrase --spatial structural element--. It is respectfully submitted that this phrase refers to a sampling window such as test areas 6 of FIG. 2 and FIG. 3 of Qian, which are described, for example, at column 3, line 63 - column 4, line 23.

The Office Action further asserts that Qian discloses applying at least one distinct spatial modulation to, and only to, at least one representative single colorant version of at least one of the conflicting colors and directs the attention of the Applicants to column 3, lines 40-45 in support of the assertion. However, the cited portion of Qian is a brief description of FIGS. 5 and 6 explaining that FIG. 5 is an image for characterization with a single square feature and a single circular feature where each feature has an area equal to the four features of the same geometric shape in FIG. 4, and that FIGS. 6A and 6B illustrate two similar images having features of the same size and shape but which have been translated and rotated. It is respectfully submitted that the reference portion of Qian is unrelated to applying at least one distinct spatial modulation to, and only to, at least one representative single colorant version of at least one of the conflicting colors.

Shay allegedly discloses a display controller capable of accessing an external

memory for gray scale modulation data (column 1, lines 7-10). It is respectfully submitted that Shay is unrelated to rendering single colorant versions of color images. However, Shay uses the phrase --gray scale modulation-- and refers to a --gray scale modulator--.

The Office Action asserts that the gray scale modulator of Shay is operative to add spatial modulations to single colorant versions of only conflicting colors within a single colorant version of a color image. In support of this assertion, the Office Action directs the attention of the Applicant to column 8, lines 3-36. However, it is respectfully submitted that Shay does not disclose or suggest conflicting colors. Furthermore, the spatial modulator of Shay is related to preventing flickering in a liquid crystal display by modulating adjacent pixels of the same gray value at "different frequencies" using phase delay. Pixels are modulated for gray scale by presenting their data bits high and low in successive frame scans (column 8, lines 7-13). That is, adjacent pixels are preferably not modulated in exactly the same way so that they will not blink in sync, or unwanted flickering may occur, an odd and even mapping scheme is used. For example, for a dark gray pixel on an even row, certain bits will be used to determine the graphic value. For a dark gray pixel on the next odd row, different bits will be used to determine the graphic value. In this way, no two consecutive rows will be modulated exactly the same. However, the frequencies can be the same for the next even row because no flickering will be perceived by the eye with the rows separated by another row (in space and in time). It is respectfully submitted, that the use of the phrase --spatial modulation-- in Shay is unrelated to the modulation of a black and white version of a conflicting color disclosed in the present application and recited in the claims.

The Claims are Not Obvious

Claims 4-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tomizawa in view of Qian.

In explaining the rejection of **claim 4**, the Office Action asserts that Tomizawa discloses a method for rendering an image described in a multicolor colorspace, in a single colorant colorspace. In support of this assertion, the Office Action directs the attention to the Applicants to column 7, lines 23-31, column 6, lines 1-5 and column 5, lines 31-47. However, as explained above, Tomizawa is unconcerned with rendering an image described in a multicolor colorspace, in a single colorant

colorspace, and the cited portions of Tomizawa do not support the assertion of the Office Action.

Column 7, lines 23-31 explain that an input colorspace discriminating portion 11, of the system of Tomizawa, extracts data corresponding to the same coordinates as those of pixels which were judged by the color component discriminating portion to be pixels of a face area of the original image. The discriminating portion 11, then prepares a histogram in an input colorspace by using the extracted data. For example, with the input format of RGB signals, the discriminating portion prepares three histograms for respective primary colors (red, green and blue). It is respectfully submitted that the cited portion is unrelated to rendering an image described in a multi-color colorspace, in a single colorant colorspace.

Column 6, lines 1-5 explain that the controlled portion 5, of the system of Tomizawa, decides to which group (thick or thin) the extracted persons skin color belongs according to the counted pixel values and decides, on the basis of a color discrimination procedure, a range of color component values to be used for further area extraction. Column 5, lines 31-47 describe FIGS. 5 and 6 of Tomizawa. The figures show histograms of hue values derived from an image including a face area. In FIG. 5, there is shown a histogram obtained from an image including therein a person with a relatively thin colored skin such as white or yellow. In FIG. 6, there is shown a histogram obtained from an image including a person having a relatively thick colored skin such as black. In FIG. 5, pixels of a skin color area are usually distributed in a ridge (peak) M1 of the histogram. Namely, pixels representing a skin color exist in a range W1 in which hue value takes 0.15 to 0.45 rad. On the other hand, the histogram of FIG. 6 shows no ridge of frequency (pixels) in the range W1. That is, no skin color area exists within the hue value range W1. The skin color area is distributed in a ridge M2 of the histogram, which ridge lies within a range W2 of hue values. It is respectfully submitted that this cited portion of Tomizawa simply describes the range of hues associated with various skin tones and does not disclose or suggest a method for rendering an image described in a multicolor colorspace, in a single colorant colorspace.

For at least the foregoing reasons, **claim 4**, as well as **claims 5-9**, which depend therefrom is not anticipated and is not obvious in light of Tomizawa and Qian taken alone or in any combination.

Additionally, the Office Action asserts that Tomizawa discloses classifying peaks within the histogram that have similar luminants, as conflicting colors. In support of this assertion, the Office Action directs the attention of the Applicant to column 7, lines 32-35. However, the referenced lines recite that a face area of the input original image in the colorspace is discriminated by detecting peaks (frequency distributions) above a noise level in a respective histogram, and a threshold for the face area in the input colorspace is determined. It is respectfully submitted that this is not a disclosure or a suggestion of classifying peaks as conflicting colors. Instead, the referenced section describes determining a threshold to be used in extracting a face area from an image.

For at least this additional reason, **claim 4**, as well as **claims 5-9**, which depend therefrom, is not anticipated and is not obvious in light of Tomizawa and Qian taken alone or in any combination.

Additionally, the Office Action stipulates that Tomizawa fails to disclose applying at least one distinct spatial modulation to, and only to, at least one representative single colorant version of at least one of the conflicting colors, thereby ensuring that all single colorant versions of colors in the image are visually distinguishable from one another while minimizing distortions in a remainder of the single colorant version of the image.

The Office Action asserts that Qian discloses applying at least one distinct spatial modulation to, and only to, at least one representative single colorant version of at least one of the conflicting colors, thereby ensuring that all single colorant versions of colors in the image are visually distinguishable from one another while minimizing distortions in a remainder of the single colorant version of the image. In support of these assertions, the Office Action directs the attention of the Applicant to column 3, lines 10-15 and lines 40-45, as well as column 6, lines 15-29.

However, as explained above, column 3, lines 10-15 are related to a summary of a method for characterizing an image comprising the steps of defining a spatial structural element including a plurality of picture elements, delineating on the image a number of test areas corresponding to the spatial structural element, and quantifying the color or, in the alternative, the texture of the image in the delineated test areas. Column 3, lines 40-45 briefly describe FIGS. 5 and 6 which show various images in association with test areas. Column 6, lines 15-29 explain that the data resulting from a processed image may be represented as a set of quantized

colors, μ_0-μ_{10}, together with an indication of the number of test areas having a sufficiently homogenous color matching one of the quantized colors. In other words, if μ_5 is red and six test areas are sufficiently homogenously red, then μ_5 would have a total of six. The result is a histogram where each of the entries totals the number of test areas having sufficiently homogenous colors, as opposed to the summation of the colors of the individual pixels. The image may be processed with different test area sizes to provide additional data. The resulting data for many images may be used for image comparison purposes.

It is respectfully submitted that these cited portions of Qian do not disclose or suggest conflicting colors. Furthermore, the cited portions do not disclose or suggest applying at least one distinct spatial modulation to and only to at least one representative single colorant version of at least one of the conflicting colors, thereby ensuring that all single colorant versions of colors in the image are visually distinguishable from one another while minimizing distortions in a remainder of the single colorant version of the image.

For at least the foregoing additional reasons, **claim 4**, as well as **claims 5-9**, which depend therefrom, is not anticipated and is not obvious in view of Tomizawa and Qian taken alone or in any combination.

Furthermore, the Office Action asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to include applying a spatial modulation to one representative color of the conflicting color to avoid a color blob and to allow a user to distinguish image features. However, as explained above, Tomizawa and Qian do not disclose or suggest conflicting colors. Tomizawa and Qian do not disclose or suggest applying a spatial modulation as disclosed in the present application and recited in **claim 4**. Tomizawa and Qian do not disclose or suggest applying at least one distinct spatial modulation as disclosed in the present application and recited in **claim 4**. Tomizawa and Qian do not disclose or suggest rendering a single colorant version of a color image. Additionally, Tomizawa and Qian do not disclose or suggest a desire to avoid a color blob. Furthermore, Tomizawa and Qian do not disclose or suggest that applying spatial modulation to one representative color of the conflicting color would avoid a color blob. In summary, Tomizawa and Qian do not disclose or suggest many of the elements for which they are relied upon. Even if their references do contain the subject matter for which they are relied upon, the only motivation for combining the references is found

in the present application. Therefore the rejection of **claims 4-9** is based on impermissible hindsight.

For at least the foregoing reasons, **claim 4**, as well as **claims 5-9**, which depend therefrom, is unanticipated and is not obvious in light of Tomizawa and Qian taken alone or in any combination.

Additionally, **claim 6** recites applying spatial modulation further comprises associating a unique modulation to the single colorant versions of each of the conflicting colors. In explaining the rejection of **claim 6**, the Office Action asserts that Qian discloses applying spatial modulation further comprises associating a unique modulation to the single colorant versions of each of the conflicting colors. In support of this assertion the Office Action directs the attention of the Applicant to FIGS. 7 and 8. However, FIG. 7 is an exemplary illustration of the resulting image data for a first aspect of the invention of Qian. FIG. 8 is an exemplary illustration of the resulting image data for a second aspect of the invention of Qian (column 3, lines 45-50). The invention of Qian is a method for characterizing an image. The method includes defining a spatial structural element including a plurality of picture elements, delineating on said image a plurality of test areas corresponding to the spatial structural element, wherein the selection of the test areas is not based upon the content of the image associated with the test areas, quantifying the color of each of the test areas on the image and characterizing the image based upon the distribution of the population of the test areas as a function of color (column 8, lines 10-25). It is respectfully submitted that the invention of Qian is not concerned with applying a spatial modulation or associating a unique modulation to a single colorant version of a conflicting color and nothing in FIGS. 7 and 8 of Qian discloses or suggests applying a spatial modulation or associating a unique modulation to a single colorant version of a conflicting color. Clarification is respectfully requested.

For at least the foregoing additional reasons, **claim 6** is not anticipated and is not obvious in light of Tomizawa or Qian taken alone or in any combination.

In explaining the rejection of **claim 7**, the Office Action asserts that Qian discloses measuring a color distance between at least one pixel in the image and at least one conflicting color and applying an attenuated spatial modulation to at least one pixel in the single colorant version of the image, the attenuation ranging from 0 to 100 percent of a reference modulation, the level of attenuation being a function of a measured color distance. In support of this assertion, the Office Action again

refers to FIG. 8.

However, it is respectfully submitted that nothing in FIG. 8 discloses or suggests measuring a color distance. Nothing in FIG. 8 discloses or suggests a conflicting color. Nothing in FIG. 8 discloses or suggests measuring a color distance between at least one pixel in an image and at least one conflicting color. Nothing in FIG. 8 discloses or suggests applying an attenuated spatial modulation to at least one pixel. Nothing in FIG. 8 discloses or suggests a single colorant version of an image. Nothing in FIG. 8 discloses or suggests applying an attenuated spatial modulation to at least one pixel in a single colorant version of an image. FIG. 8 includes column headings in terms of percentages. However, nothing in FIG. 8 discloses or suggests a spatial modulation attenuation ranging from 0 to 100 percent of a reference modulation. Furthermore, nothing in FIG. 8 discloses or suggests that a level of attenuation is a function of a measured color distance.

Apparently, FIG. 8 shows the result of a particular analysis as disclosed by Qian for a particular image, one test area included 30 percent to 40 percent of a first color (μ_0). Additionally, FIG. 8 shows that one test area included 0 to 10 percent of a second color (μ_1), four test areas included 50 percent to 60 percent of the second color, one test area included 80 percent to 90 percent of the second color (μ_1) and two test areas included 90-100 percent of the second color (μ_1). Similar numbers are provided for nine other colors (μ_2-μ_{10}). It is respectfully submitted that FIG. 8 merely reports the result of an analysis of a particular image. FIG. 8 does not disclose or suggest measuring a color distance between at least one pixel in the image and at least one conflicting color and applying an attenuated spatial modulation to at least one pixel in the single colorant version of the image, the attenuation ranging from 0-100 percent of a reference modulation, the level of attenuation being a function of the measured color distance.

For at least the foregoing additional reasons, **claim 7** is not anticipated and is not obvious in light of Tomizawa and Qian taken alone or in any combination.

Claims 8 and 9 recite subject matter similar to **claim 7**, except that **claim 8** recites the level of attenuation being a nonlinear function of the measured color distance and **claim 9** recites the level of attenuation being a linear function of the measured color distance. In explaining the rejections of **claims 8 and 9**, the Office Action again simply points to FIG. 8. In this regard, arguments similar to those submitted in support of **claim 7** are submitted in support of **claims 8 and 9**. FIG. 8

does not disclose or suggest a level of attenuation being a nonlinear function or a linear function of a measured color distance.

For at least these additional reasons, **claims 8 and 9** are not anticipated and are not obvious in view of Tomizawa and Qian taken alone or in any combination.

Claims 10-23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tomizawa in view of Shay.

In explaining the rejection of **claim 10**, the Office Action asserts that Tomizawa discloses an image processor operative to generate a single colorant version of a color image comprising an image analyzer operative to find and classify conflicting colors in the color image. In support of this assertion, the Office Action directs the attention of the Applicant to input colorspace discriminating portion, column 7, lines 24-38, which prepares input color and extracts color components of a detected peak in the histogram for a colorspace.

However, nothing in column 7, lines 24-38 discloses or suggests generating a single colorant version of a color image. Nothing in column 7, lines 24-38 discloses or suggests an image analyzer operative to find and classify conflicting colors in a color image.

It is respectfully submitted, that column 7, lines 24-38 describe extracting data corresponding to the coordinates of pixels which were judged by a color component discriminating portion to be pixels of a face area of the original image. A histogram is then prepared in input colorspace by using the extracted data. For example, with the input format of RGB signals, the portion prepares three histograms for respective primary colors (red, green and blue). A face area of the input original image in the colorspace is discriminated by detecting peaks (frequency distributions) above a noise level in respective histograms, and a threshold for the face area in the input colorspace is determined. The obtained threshold is output to a face area extracting portion. It is respectfully submitted that nothing in column 7, lines 24-38 discloses or suggests an image processor operative to generate a single colorant version of a color image or that such an image processor includes an image analyzer operative to find and classify conflicting colors in the color image.

For at least the foregoing reasons, **claim 10**, as well as **claims 11-20**, which depend therefrom, is unanticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

Additionally, the Office Action stipulates that Tomizawa fails to disclose a gray

scale modulator operative to add spatial modulations to a single colorant version of only the conflicting colors within the single colorant version of the color image. The Office Action asserts that Shay discloses a gray scale modulator operative to add spatial modulations to single colorant versions of only the conflicting colors within the single colorant version of a color image. In support of this assertion, the Office Action directs the attention of the Applicant to column 8, lines 3-36 of Shay. However, as explained above, while the referenced portion of Shay includes the phrase --spatial modulation--, the referenced portion of Shay is concerned with preventing flicker in a liquid crystal display by blinking alternate pixels or rows of pixels out of phase with one another. Nothing in Shay discloses or suggests generating a single colorant version of a color image. Nothing in Shay discloses or suggests that conflicting colors exist. Nothing in Shay discloses or suggests adding spatial modulation to a single colorant version of only the conflicting colors within a single colorant version of a color image.

For at least these additional reasons, **claim 10**, as well as **claims 11-20**, which depend therefrom, is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

Additionally, the Office Action asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to include applying a spatial modulation to one representative color of the conflicting color to allow a user to distinguish between colors having a close correlation with illuminants. However, Tomizawa and Shay do not disclose or suggest conflicting colors. The spatial modulation of Shay is unrelated to the spatial modulation recited in **claim 10** of the present application. Tomizawa and Shay do not disclose or suggest many of the elements for which they are relied upon. Furthermore, there is no motivation in the references to combine the liquid crystal display modulation of Shay with the face area extraction of Tomizawa. Even if the references include the subject matter for which they are relied upon, the only motivation to make the combination is found in the present application. Therefore, the rejection of **claim 10** is based on impermissible hindsight.

For at least these additional reasons, **claim 10**, as well as **claims 11-20**, which depend therefrom, is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

Additionally, in explaining the rejection of **claim 11**, the Office Action asserts

that Tomizawa discloses a histogram collector operative to classify pixels in the color image based on a characteristic that is also used to generate a single colorant version. In support of this assertion the Office Action directs the attention of the Applicant to column 4, lines 53-59. However, column 4, lines 53-59 explain that at step S3, the determined 2-dimensional histogram is clustered by cutting out small peaks therefrom by a plain ST parallel to the coordinate plane and detecting small peaks. At step S4, a large number of pixels are clustered on the basis of the detected small peaks cut out from the 2-dimensional histogram, and surrounding pixels are integrated together to form an integrated area. It is respectfully submitted that the cited portion of Tomizawa, while mentioning a histogram, is unrelated to classifying pixels in the color image based on a characteristic that is also used to generate a single colorant version of the image.

For at least the foregoing additional reason, **claim 11** is unanticipated by Tomizawa and Shay taken alone or in any combination.

In rejecting **claim 12**, the Office Action asserts that Tomizawa discloses a conflicting color detector and directs the attention of the Applicant to column 7, lines 16-23. However, as explained above, column 7, lines 16-23 are unrelated to disclosure of a conflicting color detector. Instead, column 7, lines 16-23 make reference to a color component discriminating portion which discriminates a face area in the frame of the original image read from a frame memory according to a color component value. The cited portion of Tomizawa is unrelated to conflicting colors or to generating a single colorant version of a color image.

For at least the foregoing additional reasons, **claim 12** is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

In explaining the rejection of **claim 13**, the Office Action asserts that Tomizawa asserts a color relationship discriminator operative to receive conflicting color classification information from the image analyzer and color image pixel information. In support of this assertion, the Office Action directs the attention of the Applicant to column 7, lines 23-31. However, column 7, lines 23-31 explain that the input colorspace discriminating portion extracts data corresponding to the same coordinates as those of pixels which were judged by the color component discriminating portion to be pixels of a face area of the original image read from the frame memory. The color component discriminating portion then prepares a histogram in an input colorspace by using the extracted data. For example, with the

input format of RGB signals, the portion generates three histograms for a respective primary colors (red, green and blue). It is respectfully submitted that nothing in the cited portion of Tomizawa discloses or suggests receiving conflicting color classification information.

For at least this additional reason, **claim 13** is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

In explaining the rejection of **claim 14**, the Office Action asserts that Shay discloses a spatial modulation attenuator operative to attenuate a gray scale modulation based on the relationship between a color image pixel and a conflicting color. In support of this assertion the Office Action directs the attention of the Applicant to column 8, lines 13-18. However, Shay is concerned with a display controller capable of accessing an external memory for gray scale modulation data associated with driving a liquid crystal display. Shay is unconcerned with attenuating gray scale modulation based on a relationship between a color image pixel and a conflicting color. Column 8, lines 13-18 of Shay are directed toward modulating rows of a liquid crystal display out of phase to avoid flickering (column 8, lines 9-11). Column 8, lines 13-18 do not disclose or suggest a spatial modulation attenuator operative to attenuate a gray scale modulation based on a relationship between a color image pixel and a conflicting color. Shay does not disclose or suggest that conflicting colors even exist.

For at least the foregoing additional reasons, **claim 14** is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

In explaining the rejection of **claim 15**, the Office Action asserts that Shay discloses a spatial modulation generator operative to generate a gray scale modulation for application to a single colorant version of a color. In support of this assertion, the Office Action again directs the attention of the Applicant to column 8, lines 13-18. Column 8, lines 13-18 are related to modulating different rows of a liquid crystal display out of phase, in order to avoid flicker. Column 8, lines 13-18 of Shay do not disclose or suggest a spatial modulation generator operative to generate a gray scale modulation for application to single colorant version of a color image.

For at least the foregoing additional reasons, **claim 15** is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

Claim 16 recites the image processor of **claim 13** wherein the relationship

between the conflicting color and the color image pixel comprises a color distance within a colorspace. In explaining the rejection of **claim 16**, the Office Action asserts that Tomizawa discloses a relationship between the conflicting color and the color image pixel comprises a color distance within a colorspace. In support of this assertion, the Office Action directs the attention of the Applicant to column 5, lines 56-64. However, Tomizawa does not disclose or suggest a color distance. It is respectfully submitted that column 5, lines 56-64 discloses that a primary discriminating portion extracts pixels whose hue values lie within a range W1 defined by an upper limit value h2 and a lower limit value h1 which are output from a control portion. Usually, h1 is set at 0.15 radians and h2 is set at 0.45 radians. The extraction result is output to a pixel counting portion. It is respectfully submitted that nothing in column 5, lines 56-64 discloses or suggests that a relationship between a conflicting color and a color image pixel comprises a color distance within a colorspace.

For at least the foregoing additional reasons, **claim 16** is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

Claims 17 and 18 recite subject matter similar to that recited in **claim 16** except that **claim 17** specifies the colorspace to be perceptually uniform and **claim 18** recites a color distance within a CIELAB colorspace. Arguments similar to those submitted in support of **claim 16** are submitted in support of **claims 17 and 18**. Additionally, Tomizawa does not disclose or suggest a CIELAB colorspace.

For at least the foregoing additional reasons, **claims 17 and 18** are not anticipated and are not obvious in light of Tomizawa and Shay taken alone or in any combination.

Claim 20 recites the image processor of **claim 19** wherein the image receiver further comprises a xerographic printer. In explaining the rejection of **claim 20**, the Office Action directs the attention of the Applicants to column 8, lines 29-30. However, column 8, lines 29-30 recite it is possible to provide an effective technical apparatus for practical use realizing the above. While the Applicant agrees that a xerographic printer is an effective technical apparatus for practical use, it is respectfully submitted that column 8, lines 29-30 do not disclose or suggest that an image receiver comprises a xerographic printer.

For at least the foregoing additional reasons, **claim 20** is not anticipated and is not obvious in light of Tomizawa and Shay taken alone or in any combination.

In explaining the rejections of **claims 21-23**, the Office Action asserts they are rejected based on similar rational as **claims 4-6** respectively. However, **claims 4-6** were rejected under 35 U.S.C. §103(a) as being unpatentable over Tomizawa in view of Qian. Page 5 of the detailed Office Action indicates that **claims 21-23** were rejected under 35 U.S.C. §103(a) as being unpatentable over Tomizawa in view of Shay. Clarification is respectfully requested.

Nevertheless, arguments similar to those submitted in support of **claims 4-6 and 10-19** are submitted in support of **claims 21-23**. Tomizawa, Qian and Shay do not disclose or suggest a method for rendering an image described in a multi-colorant colorspace, in a single colorant colorspace.

For at least the foregoing reasons, **claims 21-23** are not anticipated and are not obvious in light of Tomizawa, Qian and Shay taken alone or in any combination.

Telephone Interview

In the interests of advancing this application to issue the Applicant(s) respectfully request that the Examiner telephone the undersigned to discuss the foregoing or any suggestions that the Examiner may have to place the case in condition for allowance.

CONCLUSION

Claims 1-3 stand withdrawn with traverse. **Claims 4-23** remain in the application. For the foregoing reasons, the case is in condition for allowance. Accordingly, an indication of thereof is respectfully requested.

Respectfully submitted,

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